

CLAIMS

What is claimed is:

- 1 1. A method for coordinating predefined actions for at least two nodes, the method
2 comprising:
 - 3 generating at least two quantum-entangled particles;
 - 4 defining at least two selectable actions at each of the nodes, a first one of the at
5 least two selectable actions being identified by a first quantum state and a second one of
6 the at least two quantum-entangled particles being identified by a second quantum state
7 that is different than the first quantum state;
 - 8 sending a respective one of the quantum-entangled particles to each of the at least
9 two nodes;
 - 10 detecting a state of a first one of the quantum-entangled particles at a first one of
11 the nodes, whereby a state of each other of the quantum-entangled particles is fixed to the
12 detected state of the first one of the quantum-entangled particles;
 - 13 after detecting the state of the first one of the quantum-entangled particles,
14 detecting the fixed state of a second one of the quantum entangled particles at a second
15 one of the nodes; and
 - 16 for at least one of the first and second nodes, selecting and performing one of the at
17 least two predefined actions, in part, as a function the detected state of the quantum-
18 entangled particles and the quantum-state identification of the predefined actions.
- 1 2. The method of claim 1, wherein selecting and performing one of the at least two
2 predefined actions as a function the detected state of the quantum-entangled particles and
3 the quantum-state identification of the predefined actions includes comparing the detected
4 state to the quantum-state identifications and, in response to finding a matching state,
5 performing the predefined actions identified by the matching state.

1 3. The method of claim 1, wherein selecting and performing one of the at least two
2 predefined actions as a function the detected state of the quantum-entangled particles and
3 the quantum-state identification of the predefined actions includes:

4 generating a pseudorandom code as a function of the detected state of the quantum-
5 entangled particles; and

6 selecting and performing one of the at least two predefined actions as a function of
7 the pseudorandom code.

1 4. The method of claim 3, wherein generating a pseudorandom code includes
2 generating a substantially similar pseudorandom code at both of the first and second
3 nodes.

1 5. The method of claim 4, further comprising storing characteristics of the
2 pseudorandom code at the first and second nodes, wherein generating a pseudorandom
3 code at both of the first and second nodes includes generating a pseudorandom code as a
4 function of the stored characteristics and the detected state of quantum-entangled particles.

1 6. The method of claim 1, wherein generating at least two quantum-entangled
2 particles includes generating quantum-entangled pairs of photons and wherein sending a
3 respective one of the quantum-entangled particles to each of the at least two nodes
4 includes sending a respective one of the photon pairs to each of the at least two nodes.

1 7. The method of claim 6, wherein generating quantum-entangled pairs of photons
2 includes generating pairs of photons having consistent polarization and wherein selecting
3 and performing one of the at least two predefined actions includes generating a result that
4 is consistent for each node as a function of the polarization.

1 8. The method of claim 1, further comprising:

2 identifying an expected lifetime of the entangled state of the quantum-entangled
3 particles; and

4 wherein detecting a state of a first one of the quantum-entangled particles and
5 detecting the fixed state of a second one of the quantum-entangled particles includes
6 detecting the states prior to the expected lifetime expiring.

- 1 9. The method of claim 1, further comprising:
2 regenerating the at least two quantum-entangled particles as a function of a
3 predefined interval;
4 sending a respective one of the regenerated quantum-entangled particles to each of
5 the at least two nodes; and
6 wherein detecting a state of a first one of the quantum-entangled particles and
7 detecting the fixed state of a second one of the quantum-entangled particles include
8 detecting the states of the regenerated quantum-entangled particles.
- 1 10. The method of claim 9, wherein regenerating the at least two quantum-entangled
2 particles as a function of a predefined interval includes regenerating the at least two
3 quantum-entangled particles when an expected lifetime of the entanglement of the
4 quantum-entangled particles expires before the state of the first and second quantum-
5 entangled particles is detected.
- 1 11. The method of claim 1, wherein defining at least two selectable actions includes
2 defining two selectable actions at a first node, further comprising sending the two
3 selectable actions to a second node and using the detected state of the quantum-entangled
4 particles and the two selectable actions at the second node to audit the selection and
5 performance of one of the two selectable actions at the first node.
- 1 12. The method of claim 1, wherein selecting and performing one of the at least two
2 predefined actions includes independently selecting and performing one of the at least two
3 predefined actions.
- 1 13. The method of claim 12, wherein independently selecting and performing one of
2 the at least two predefined actions includes selecting and performing one of the at least
3 two predefined actions at a first one of the nodes without communicating with other ones
4 of the nodes after sending the respective one of the quantum-entangled particles to each of
5 the at least two nodes.
- 1 14. The method of claim 1, wherein defining at least two selectable actions at each of
2 the nodes includes defining at least two encryption functions at each of the nodes and

3 wherein selecting and performing one of the at least two predefined actions includes
4 selecting and performing one of the at least two encryption functions.

1 15. A method for generating an output for at least two nodes, the method comprising:
2 generating at least two sets of quantum-entangled particles, each set including at
3 least two quantum-entangled particles;
4 sending a respective one of each set of quantum-entangled particles to each of the
5 at least two nodes;
6 for each set of quantum-entangled particles, detecting a state of a first one of the
7 quantum-entangled particles at a first one of the nodes, whereby a state of each other of
8 the quantum-entangled particles is fixed to the detected state of the first one of the
9 quantum-entangled particles;
10 for each set of quantum-entangled particles, after detecting the state of the first one
11 of the quantum-entangled particles, detecting the fixed state of a second one of the
12 quantum entangled particles at a second one of the nodes; and
13 at each of the first and second nodes, generating an output as a function the
14 detected states of the quantum-entangled particles from each set of quantum-entangled
15 particles.

1 16. The method of claim 15, wherein generating an output as a function the detected
2 states of the quantum-entangled particles from each set of quantum-entangled particles
3 includes comparing the detected states of at least two quantum-entangled particles at each
4 node and performing a first function in response to the detected states that match and
5 performing a second function in response to the detected states that do not match.

1 17. The method of claim 15, wherein generating an output as a function the detected
2 states of the quantum-entangled particles from each set of quantum-entangled particles
3 includes generating at least two inputs as a function of the detected states and processing
4 the inputs to generate the output.

1 18. The method of claim 17, further comprising defining an encoding function,
2 wherein generating at least two inputs includes generating at least two bits for the

3 encoding function and wherein processing the inputs to generate the output includes
4 processing the inputs with the encoding function to generate a coding output.

1 19. A method for coordinating timing of actions at first and second nodes, the method
2 comprising:

3 generating at least two quantum-entangled particles;
4 sending a respective one of the quantum-entangled particles to each of the first and
5 second nodes;
6 detecting a state of a first one of the quantum-entangled particles at the first node,
7 whereby a state of each other of the quantum-entangled particles is fixed to the detected
8 state of the first one of the quantum-entangled particles;
9 detecting a state of a second one of the quantum entangled particles at the second
10 node after detecting the state of the first one of the quantum-entangled particles; and
11 at the first and second nodes, executing a response at a coordinated time selected as
12 a function of the detected states of the quantum-entangled particles.

1 20. The method of claim 19, wherein executing a response at a coordinated time
2 selected as a function of the detected states of the quantum-entangled particles includes, at
3 each of the first and second nodes, processing the detected state to generate an output
4 indicative of the coordinated time and viewable by a user.

1 21. A system for coordinating predefined actions for at least two nodes, the system
2 comprising:

3 means for generating at least two quantum-entangled particles;
4 means for defining at least two selectable actions at each of the nodes, a first one of
5 the at least two selectable actions being identified by a first quantum state and a second
6 one of the at least two quantum-entangled particles being identified by a second quantum
7 state that is different than the first quantum state;
8 means for sending a respective one of the quantum-entangled particles to each of
9 the at least two nodes;
10 means for detecting a state of a first one of the quantum-entangled particles at a
11 first one of the nodes, whereby a state of each other of the quantum-entangled particles is
12 fixed to the detected state of the first one of the quantum-entangled particles;

13 after detecting the state of the first one of the quantum-entangled particles, means
14 for detecting the fixed state of a second one of the quantum entangled particles at a second
15 one of the nodes; and

16 for at least one of the first and second nodes, means for selecting and performing
17 one of the at least two predefined actions as a function the detected state of the quantum-
18 entangled particles and the quantum-state identification of the predefined actions.

1 22. A system for coordinating predefined actions for at least two nodes using at least
2 two selectable actions, a first one of the at least two selectable actions being identified by a
3 first quantum state and a second one of the at least two quantum-entangled particles being
4 identified by a second quantum state that is different than the first quantum state, the
5 system comprising:

6 an entangled particle generator adapted to generate at least two quantum-entangled
7 particles;

8 a communications link adapted for sending a respective one of the quantum-
9 entangled particles to each of the at least two nodes;

10 a particle detector adapted to detect a state of a first one of the quantum-entangled
11 particles at a first one of the nodes, whereby a state of each other of the quantum-
12 entangled particles is fixed to the detected state of the first one of the quantum-entangled
13 particles;

14 another particle detector adapted to detect the fixed state of a second one of the
15 quantum entangled particles at a second one of the nodes, after the state of the first one of
16 the quantum-entangled particles is detected; and

17 for at least one of the first and second nodes, a selection arrangement adapted to
18 select and facilitate the performance of one of the at least two predefined actions as a
19 function the detected state of the quantum-entangled particles and the quantum-state
20 identification of the predefined actions.